

# *Introduction to Physical Medicine & Rehabilitation*

## *ICM-III Course USUHS*

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# *PM&R*



“Our goal is to restore patients with physical dysfunction to optimal self-sufficiency and functional performance.”

# *What do we treat?*

- Acute & Chronic Musculoskeletal Pain Complaints
- Chronic Pain Conditions
- Biomechanics
- Neuro-muscular disorders
- Effects of Deconditioning and Immobility
- Rehabilitation of
  - Sports Injuries
  - Stroke
  - TBI
  - SCI
  - Amputees
  - Nerve Injuries
  - Pediatrics
  - Post operative
  - Cardio/Pulmonary

# *How do we assess patients?*

- Comprehensive history to include functional history.
- Comprehensive physical exam to include functional exam.
- Diagnostic testing (Labs, x-rays, EDX)
- Diagnostic injections
- With and without equipment (orthotics, prosthetics, wheelchairs)

# *History*

- Pain
  - Location, intensity, duration, frequency, modifications, radiating, rest pain....
  - Red flags
- Treatment to date
  - Consults, imaging, medications
  - Therapy
- Functional History
- PMHx
  - Effect rehab/therapy rx
  - Effect medication rx
- Psychosocial Factors
  - Stressors
  - Sleep

# ***Contributing Factors***



# *Physical Exam*

- Inspection
- Palpation
- Range of Motion
- Special Tests
  - Neck
  - Back
  - Shoulder
  - Knee
- Motor
- Sensory
- Reflexes
- Gait/coordination
  - With and without assistive device

# *Physical Exam Examples*



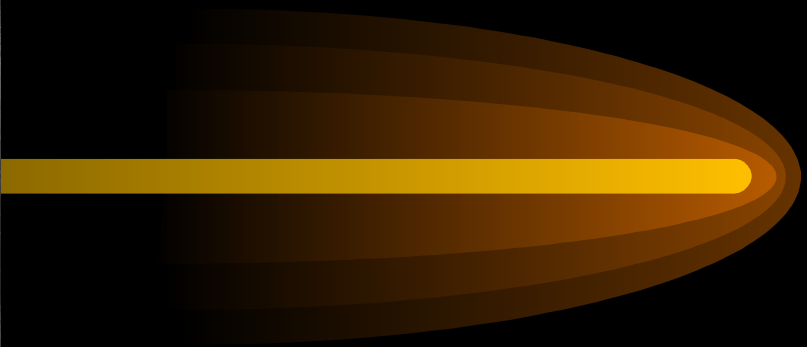


# *Bicipital Tears*

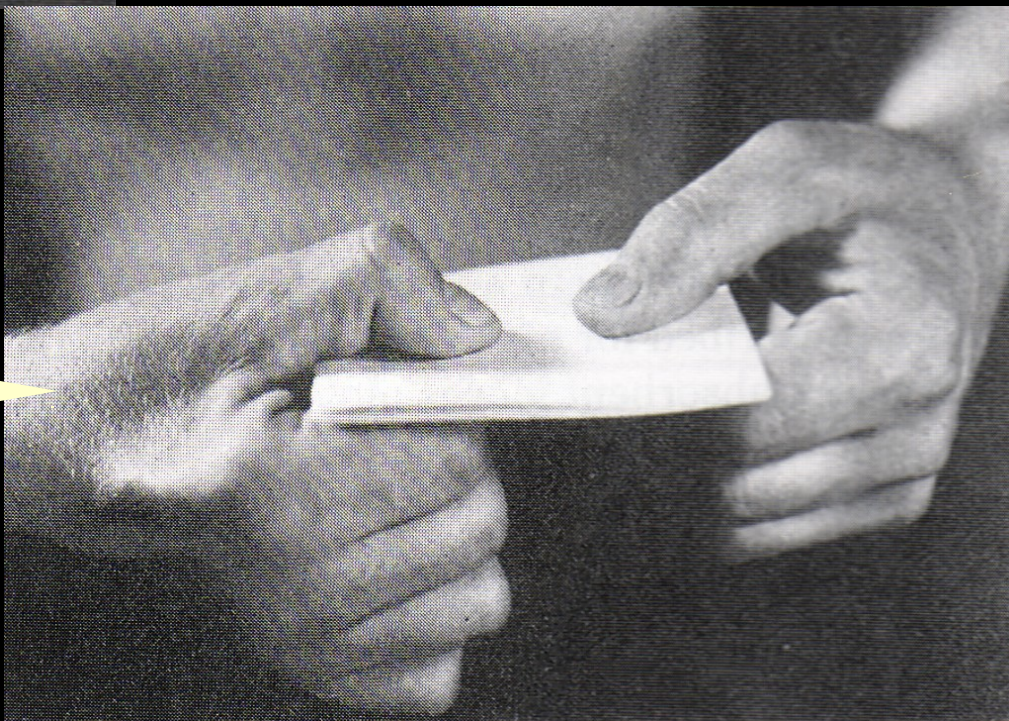
Proximal  
vs.  
Distal





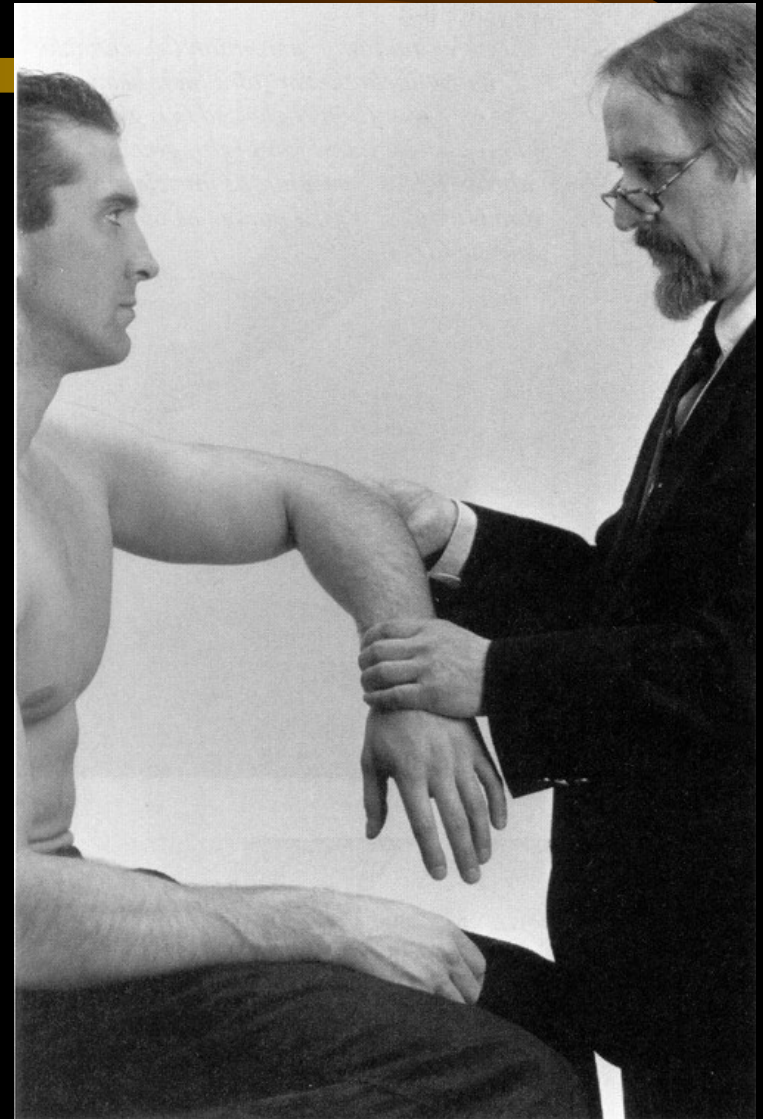


Froment's sign

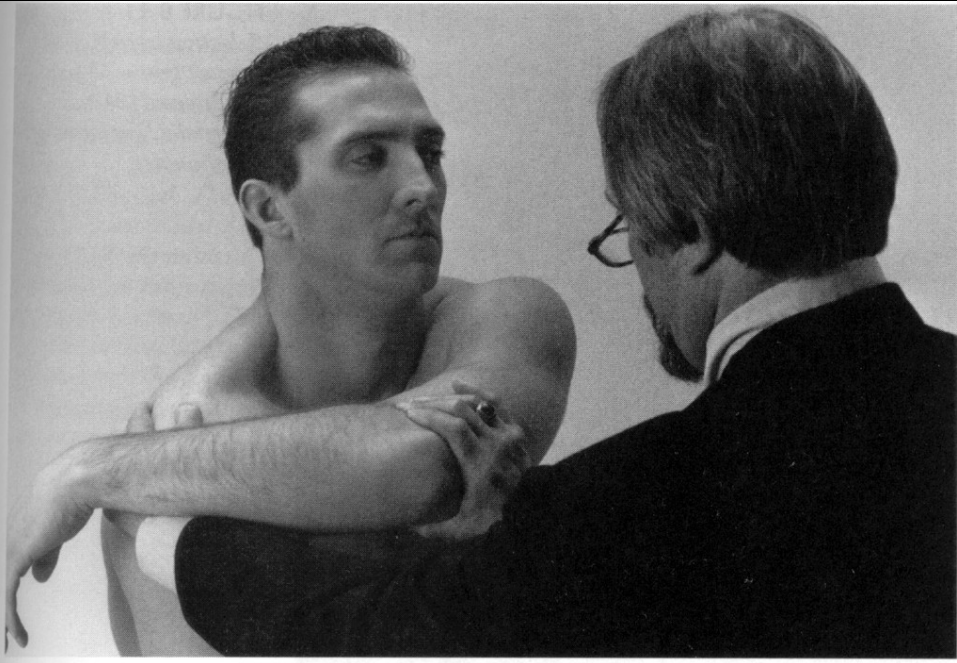




# *Tests for Impingement: Neers and Hawkins*

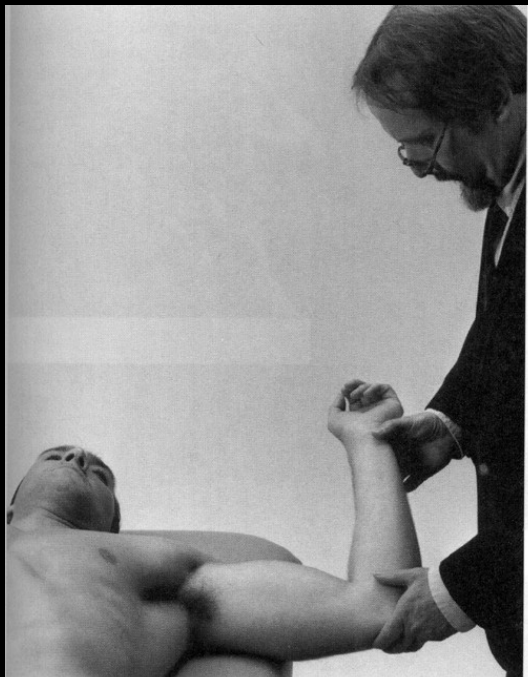






Cross Arm Test

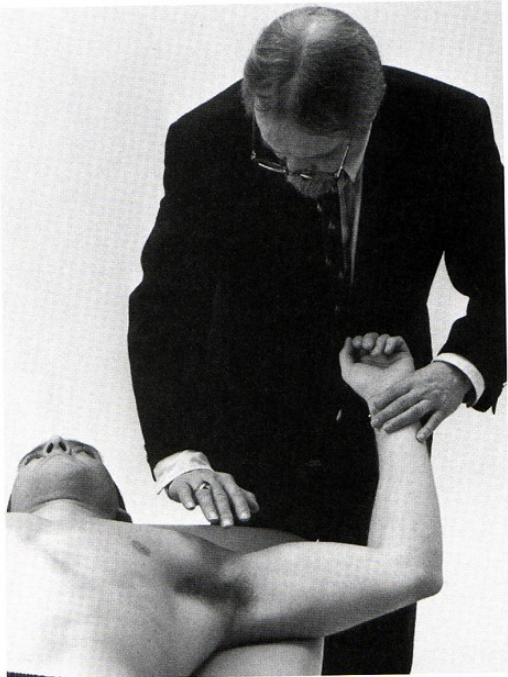
Relocation Test



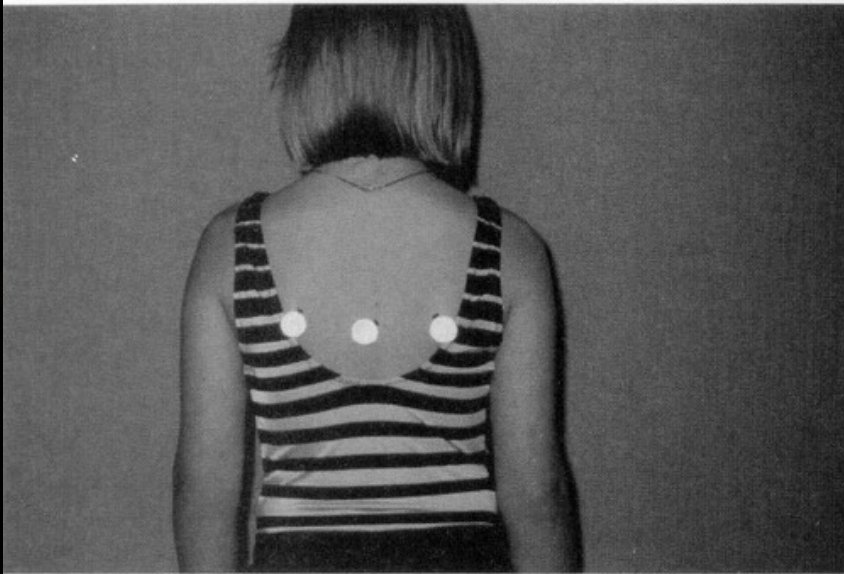
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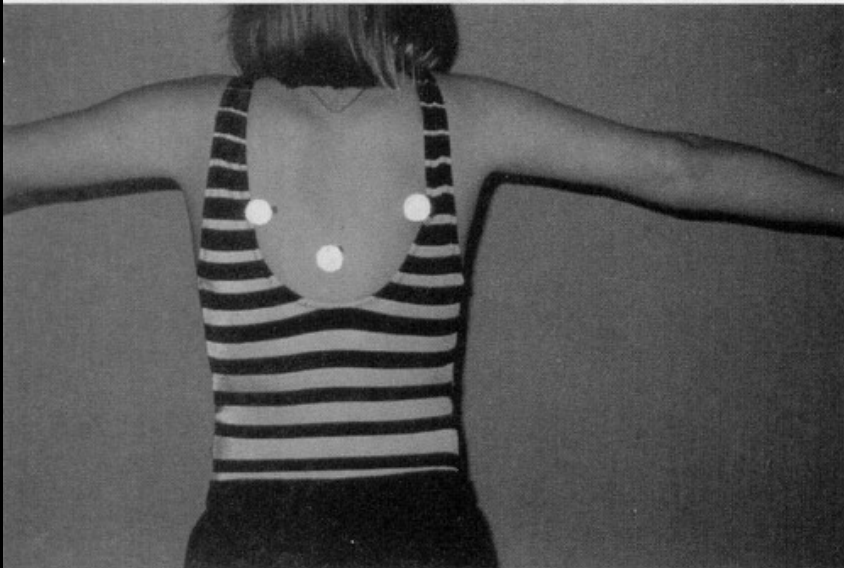
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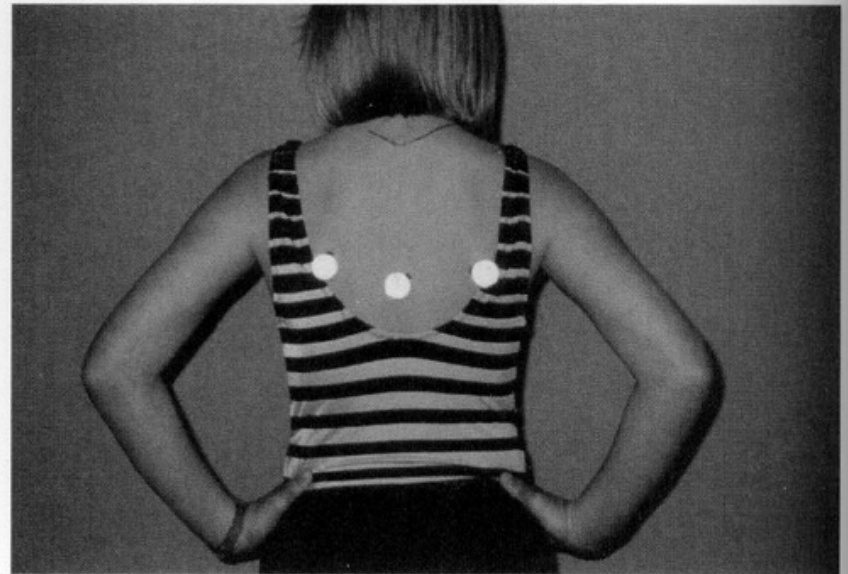
C



D



Scapular Stabilizing Muscle Function



E

#### FIGURE 8-5 (continued)

*D-F. Test positions 1-3 in an asymptomatic, 10-year-old, right-handed tennis player who had played competitively for 5 years (lateral slide of right scapula in all three positions). In such cases, the lateral scapular slide is thought to represent a maladaptation of the scapular stabilizing muscles to the stresses of repetitive overhead use of the arm and to predispose to shoulder overuse injury.*

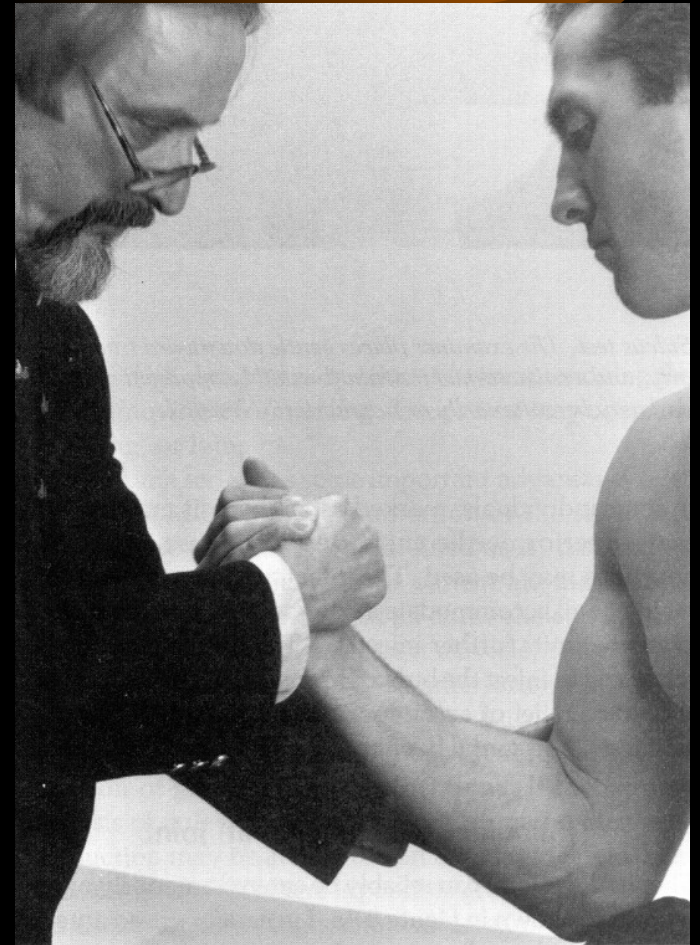
sured by the highest vertebral level to which the patient can bring his or her thumb, as shown in Figure 8-6. A re-



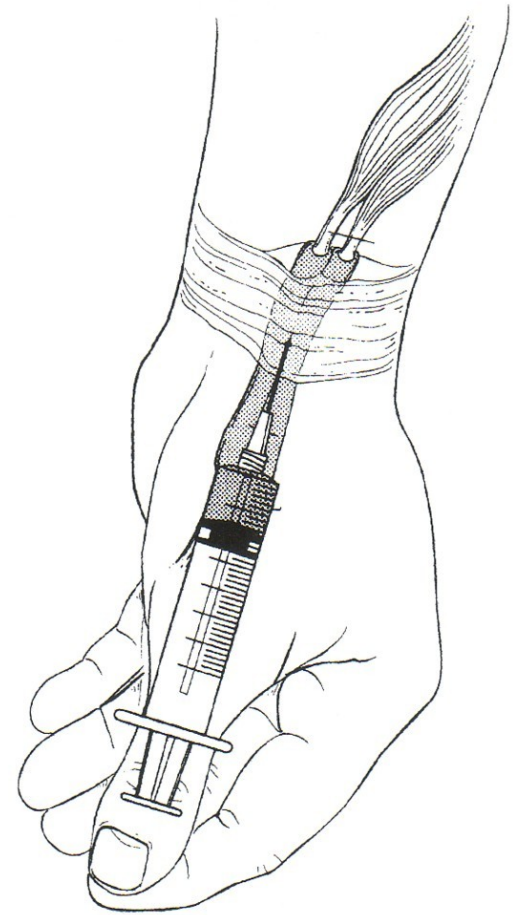
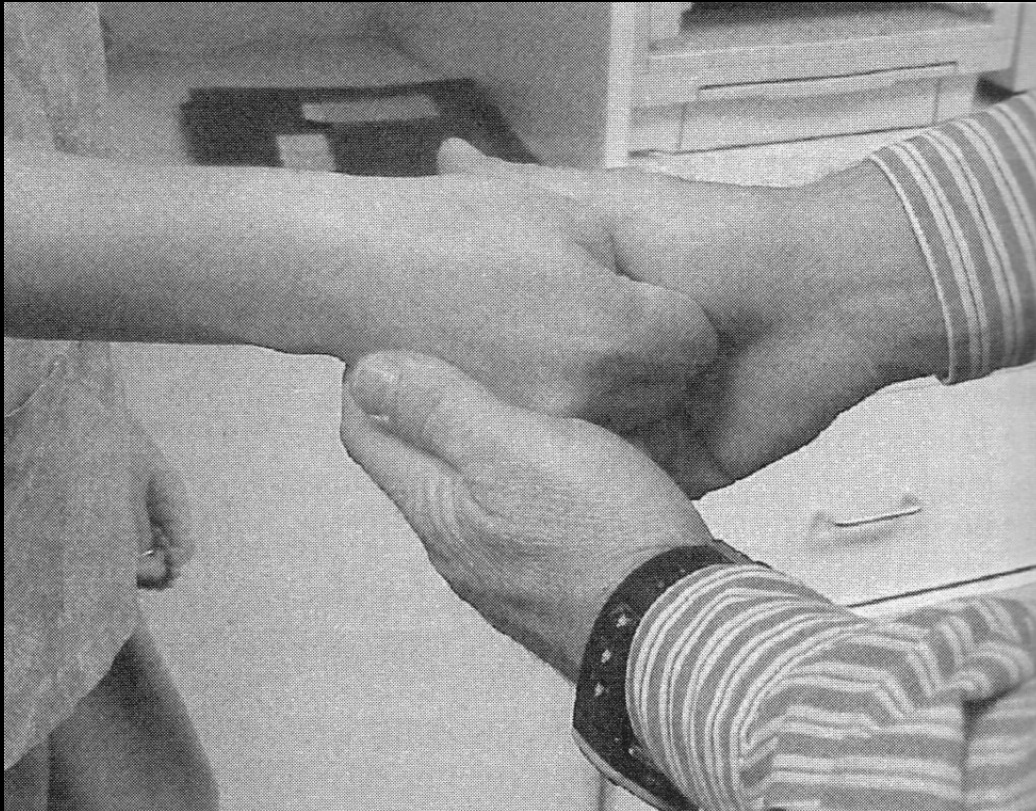


Speed's Test

Yergerson's Test



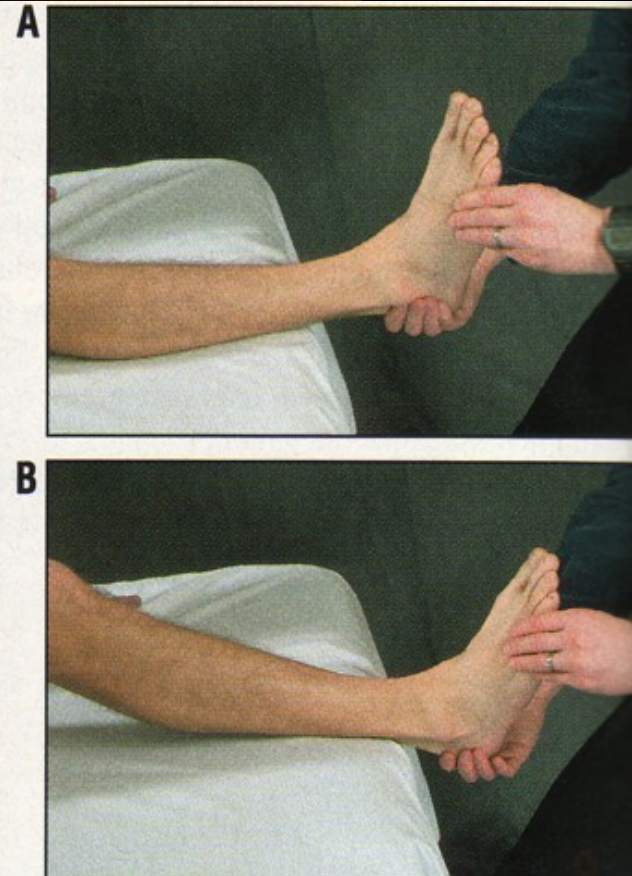
# *De Quervain's Tenosynovitis*



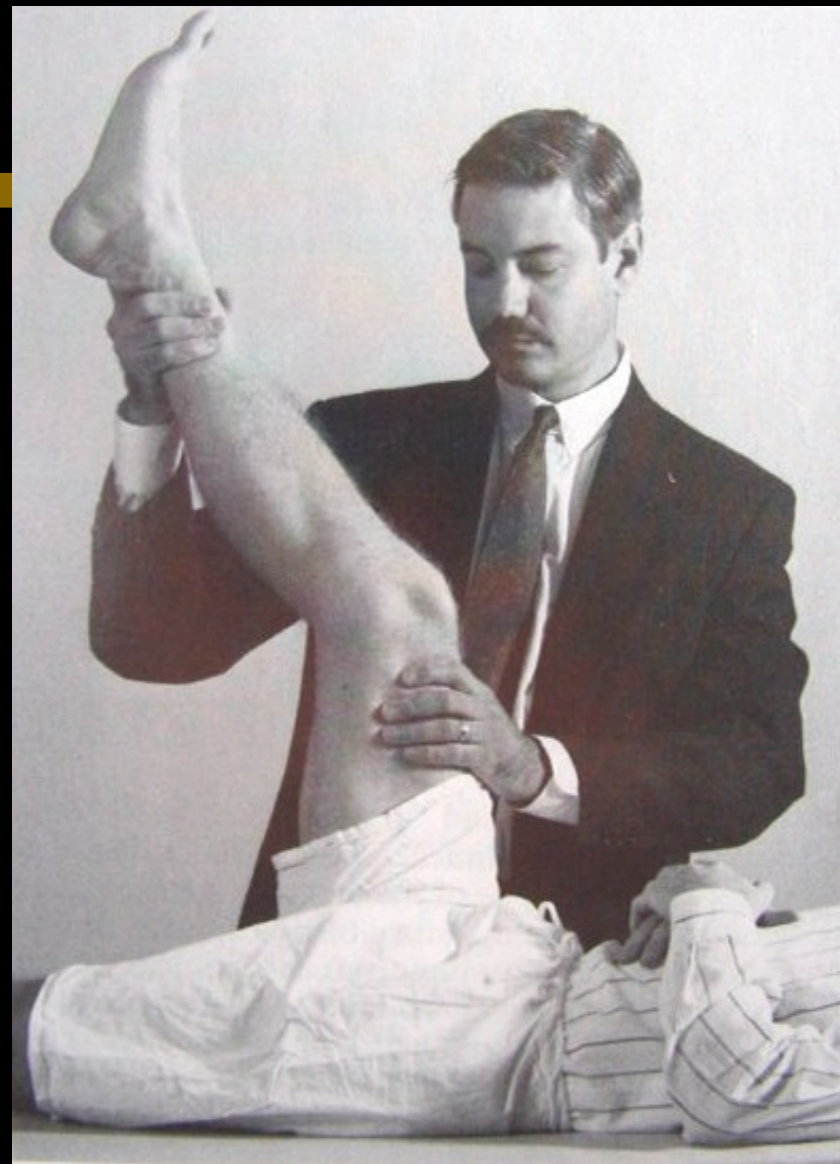
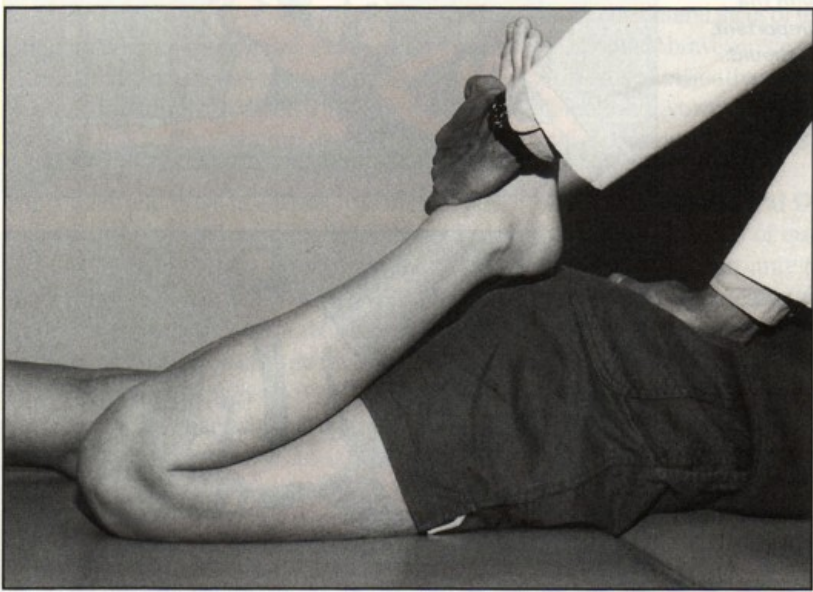
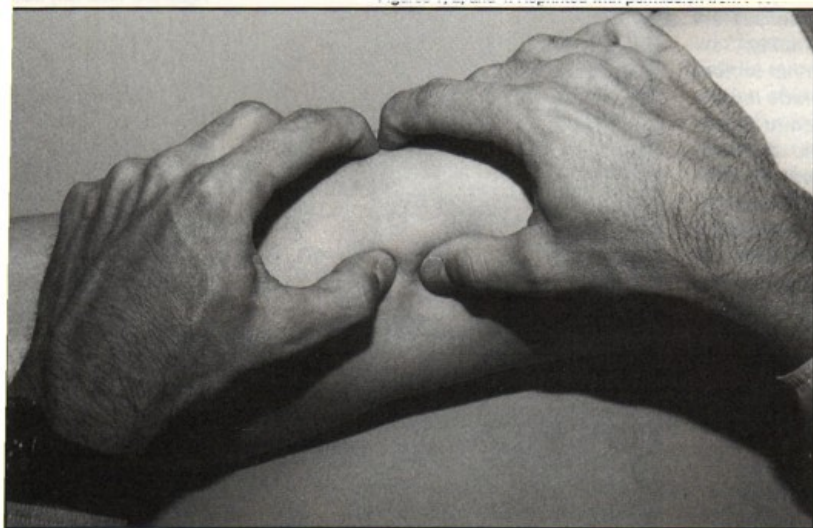


# ***Lower Extremity Flexibility and ROM***

**Modified Thomas  
Test**

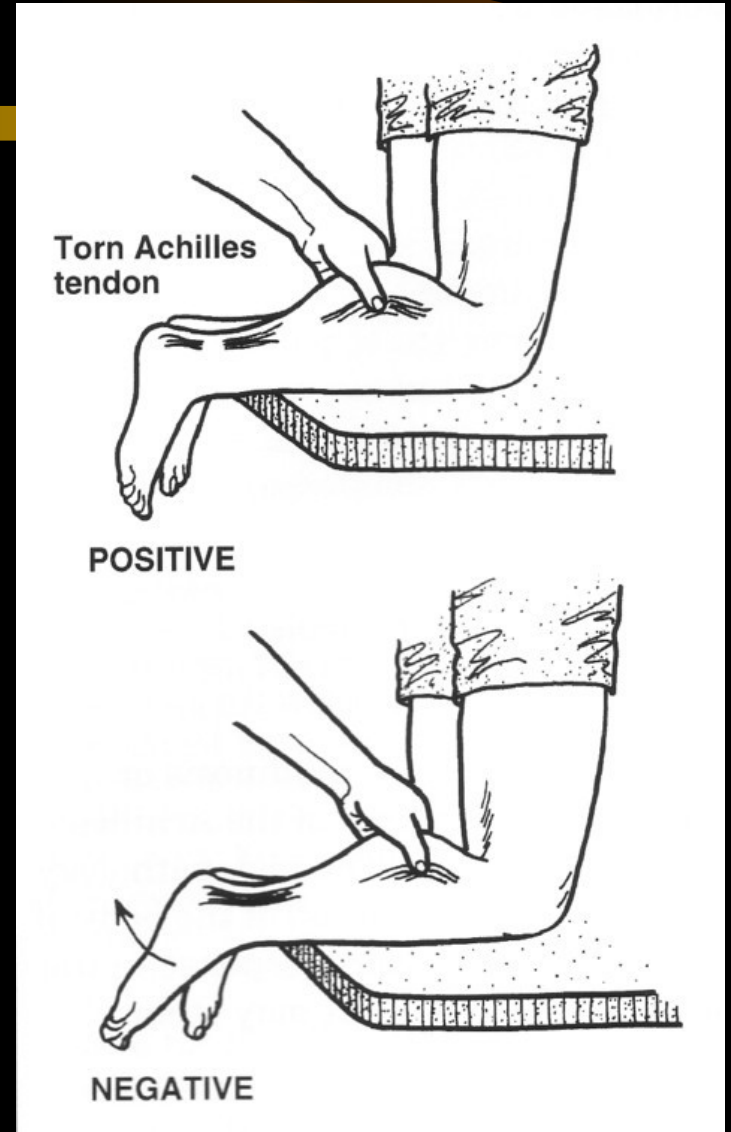






# *Achilles Rupture*

- “Weekend warriors”
- Positive Thompson’s test
- Partial vs. Complete
- Surgical vs. Conservative
- Watch for over aggressive rehab following surgery



# *Electrodiagnostic Testing (EMG's)*



- Radiculopathy / Plexopathy
- Entrapment Neuropathies
- Peripheral Neuropathies
- Motor Neuron Diseases
- Neuro-Muscular Junction Diseases
- Myopathies

# *Peripheral Neuropathy*

## *Diff Dx:*

- **Axonal (Diffuse)**

- HMSN II, V, HSAN I-IV
- Paraneoplastic
- Amyloid, Sarcoid, Sjogrens
- AIDP, Cryoglobulin
- Vit E, B1, B6, B12, CIN
- Endocrine
- HIV, Lyme
- Toxic (ETOH, Heavy Metals, Porphyria)
- Medications

- **Demyelinating (Diffuse)**

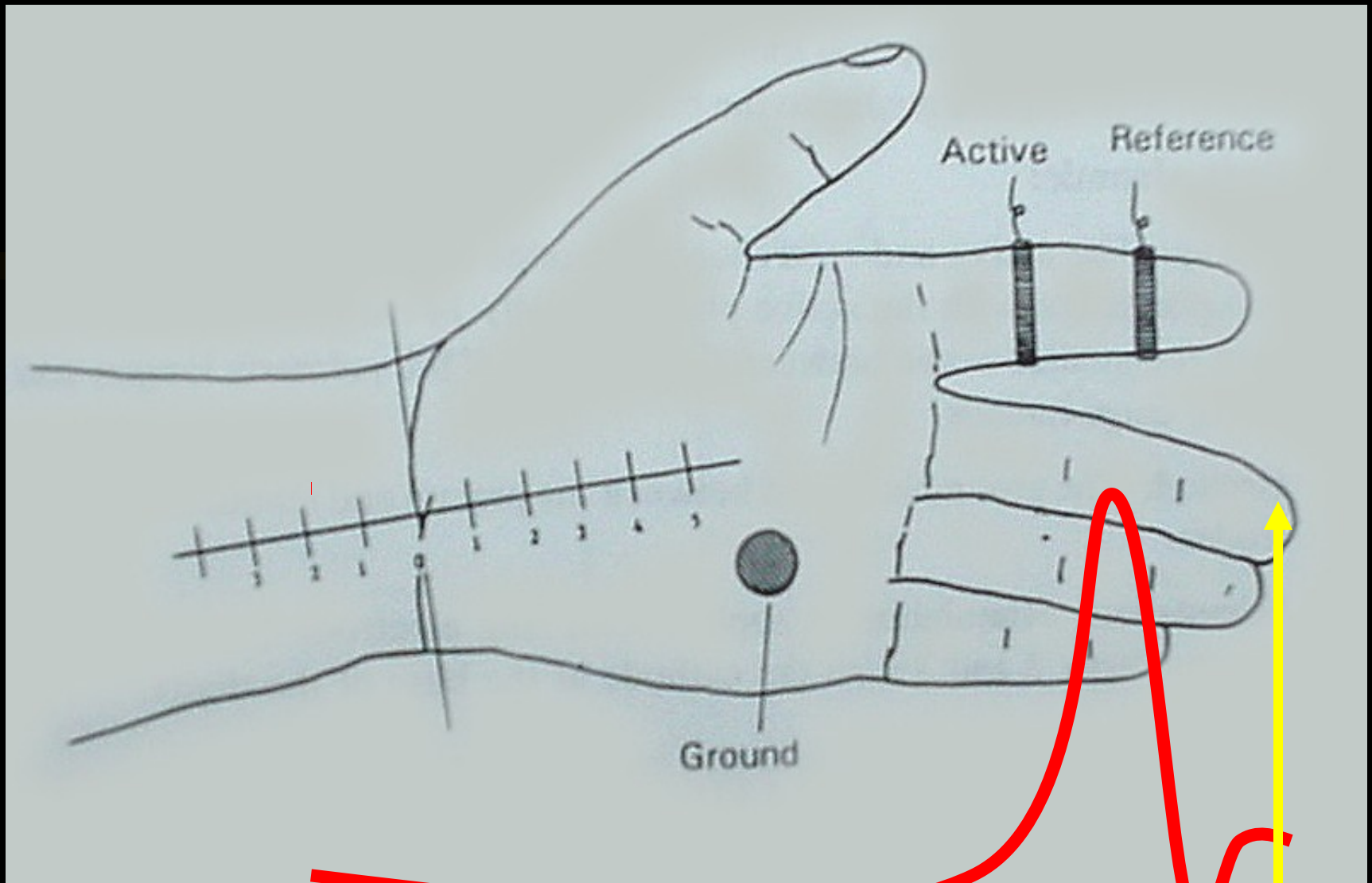
- HMSN I, III, IV
- Metachromatic Leukodystrophy

- **Axonal (Multifocal)**

- Vasculitis
- Idiopathic
- CMV in HIV
- Herpes
- Diabetes

- **Demyelinating (Multifocal)**

- AIDP, CIDP
- Paraproteinemic (MGUS, POEMS, Waldenstrom)
- HNPP
- Paraneoplastic
- Medications/Drugs



Latency

# *Common Pain Conditions*

- Cancer
- Arthritis
- Headaches
- Back & Neck
- Shoulder & Knee
- Neuropathies
  - focal & polyneuropathy
- Factitious
  - secondary gain
- Polymyalgia Rheumatica
- Fibromyalgia
- Myofascial Pain Syndrome
- Complex Regional Pain (RSD)
- Post-Herpetic Neuralgia
- Phantom Limb Pain
- Pelvic Pain
- Psychogenic
  - somatization, hysterical, conversion



Herniated NP

Exiting  
nerve root

Ligamentum  
flavum

Sup. facet

Thecal sac

Inf. facet

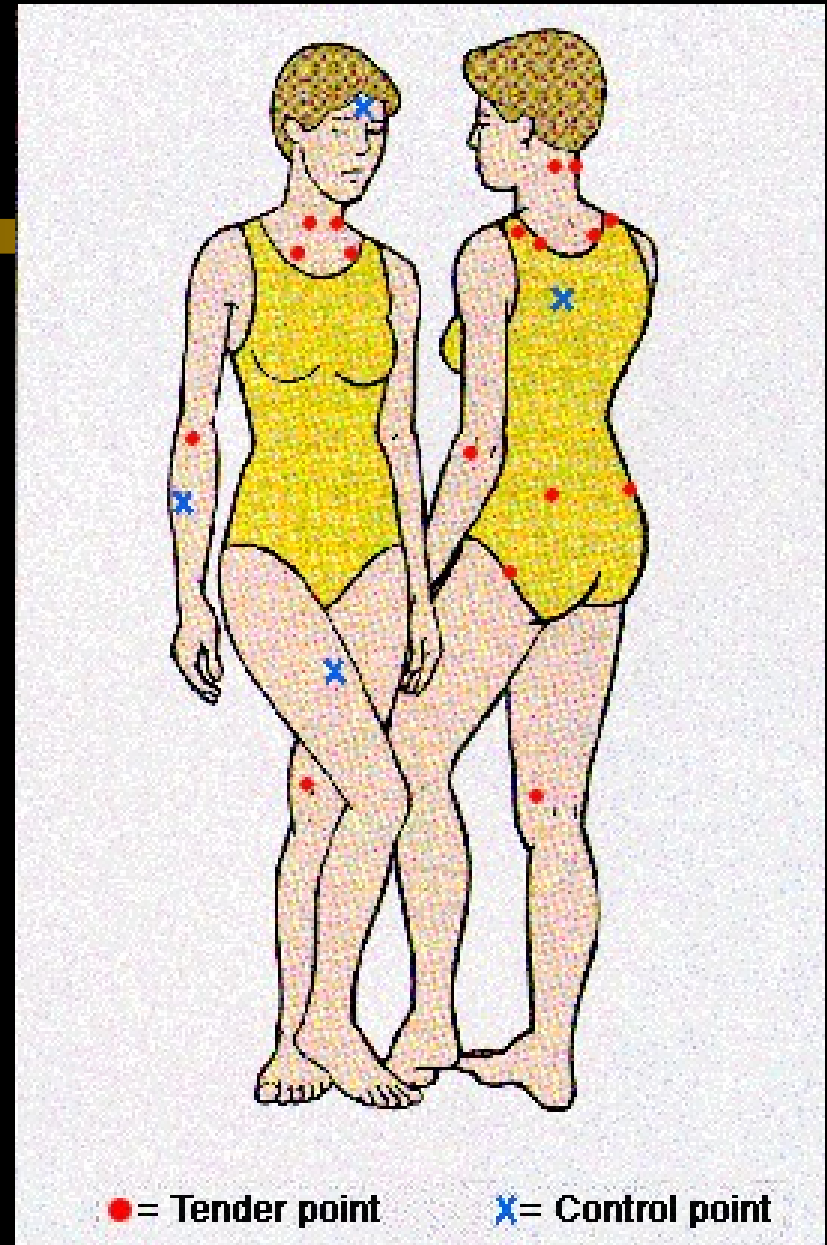
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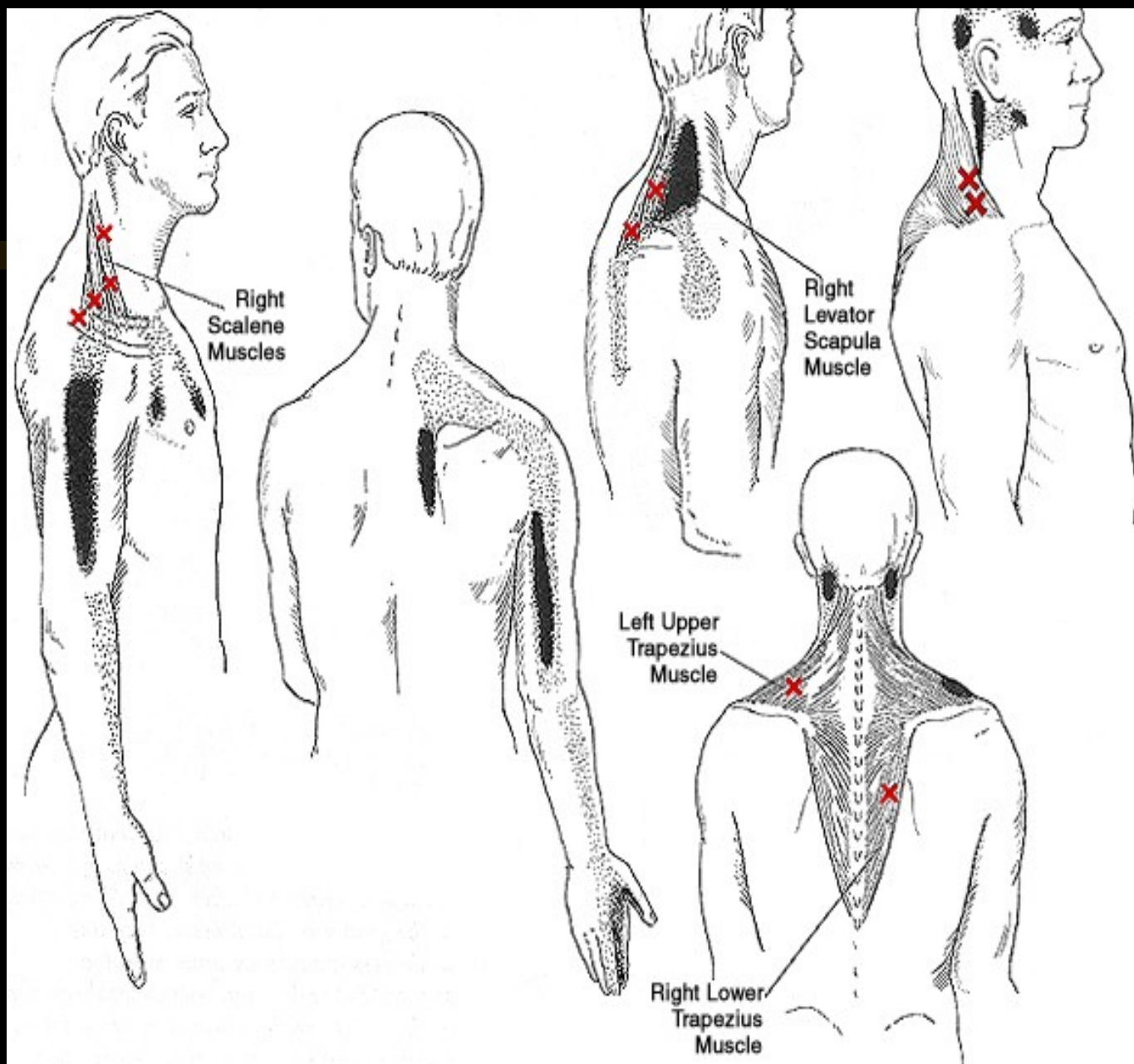
# Fibromyalgia vs.

## Myofascial Pain

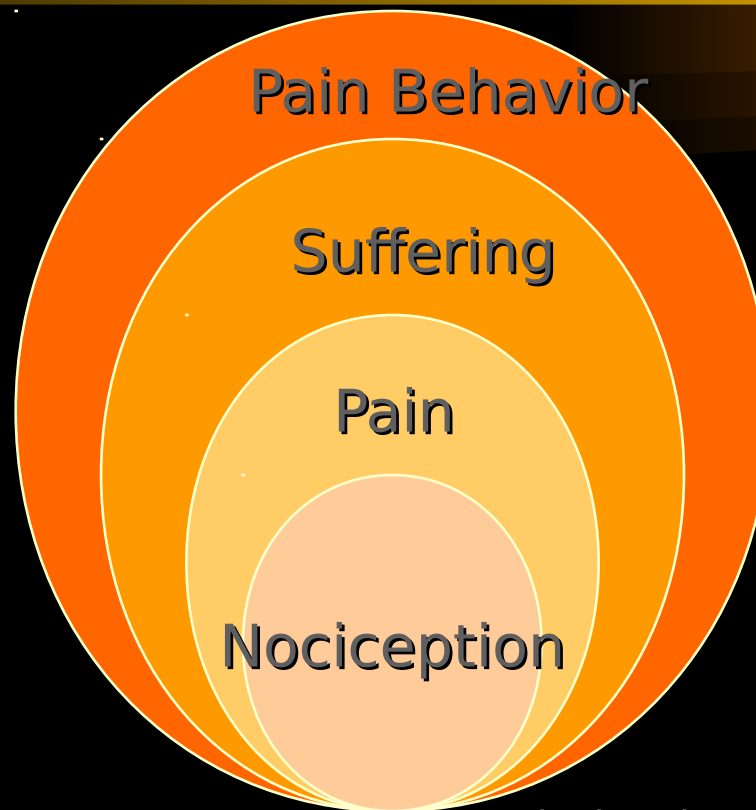
- Fibromyalgia
  - diffuse pain
  - 11 of 18 tender points
  - sleep disturbance & fatigue
- Myofascial Pain
  - local / regional
  - trigger points







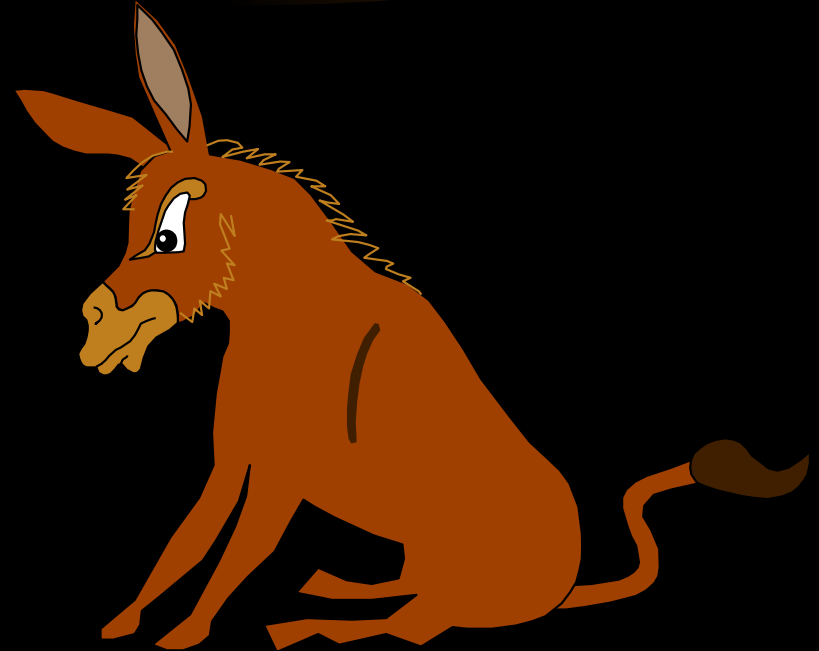
# ***The Pain Syndrome Model***



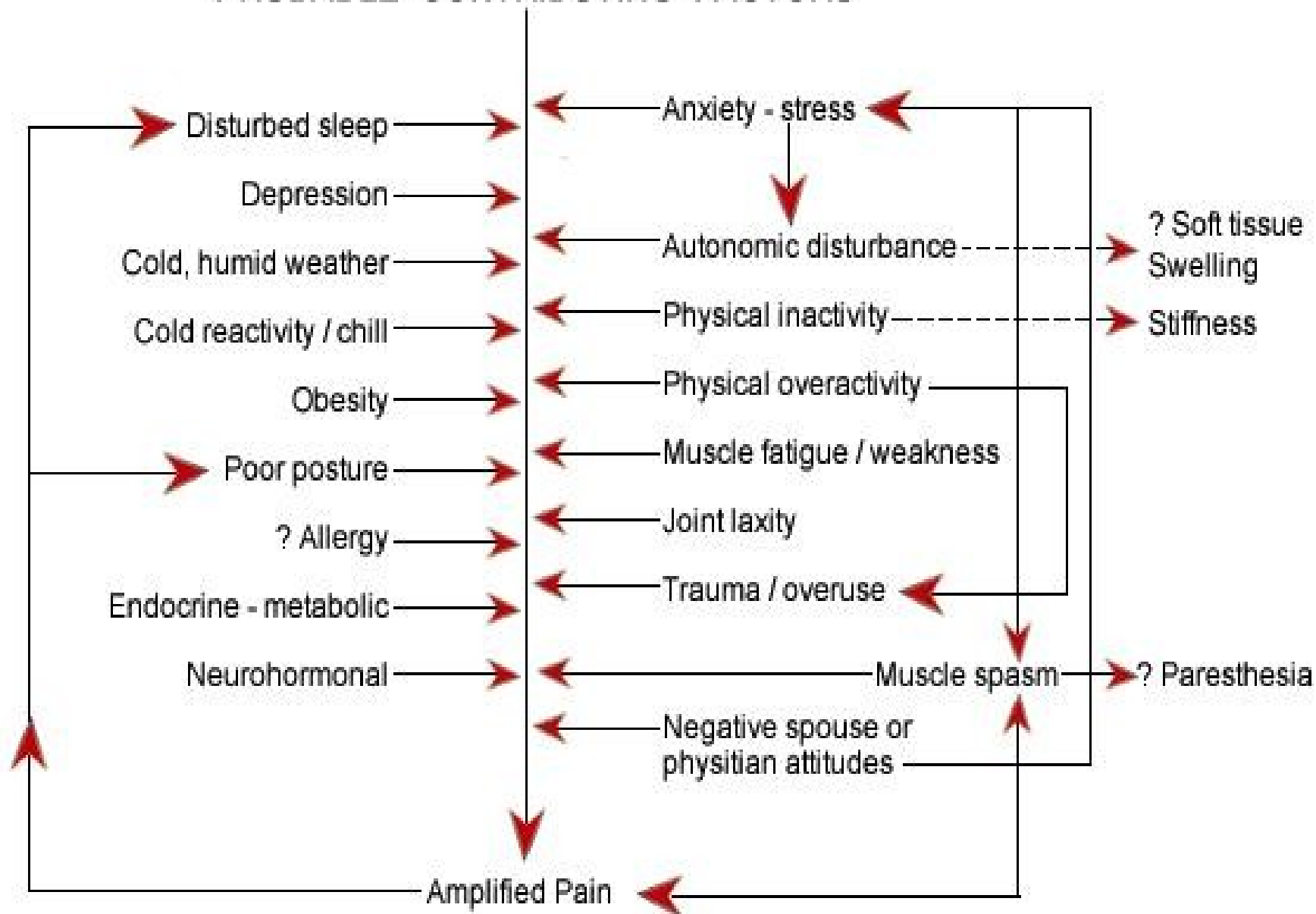
Loeser's Concept of Pain

# *Behavioral Modification*

- Focus on well behavior
- Decrease sick role / behavior



## PROBABLE CONTRIBUTING FACTORS



# *Effects of Immobility:*

- **Cardiovascular**
  - orthostasis, reduced CV performance
  - Thromboembolic
- **Respiratory**
  - Inc Mechanical resistance to breathing
  - Reduced cough
  - Reduced tidal and minute volume
  - Pulmonary embolism
- **Musculoskeletal System**
  - Contractures
  - Weakness
  - Atrophy
  - Osteoporosis
- **Integumentary System**
  - Skin atrophy
  - Pressure sores
- **Mineral/Metabolic Balance**
  - Neg Nitrogen, Ca, Sulfur, Phos, Mg, K, Na balance
- **Hormonal Disturbances**
  - Androgen
  - Insulin binding sites
  - Increase Thyroid production
- **Genito-Urinary System**
  - Urinary Stasis
  - Stones, Infection, Decreased emptying
- **Gastrointestinal System**
  - Constipation
  - Loss of appetite
- **Nervous System**
  - Sensory Deprivation, balance, coordination
  - Confusion, Disorientation
  - Anxiety, Depression



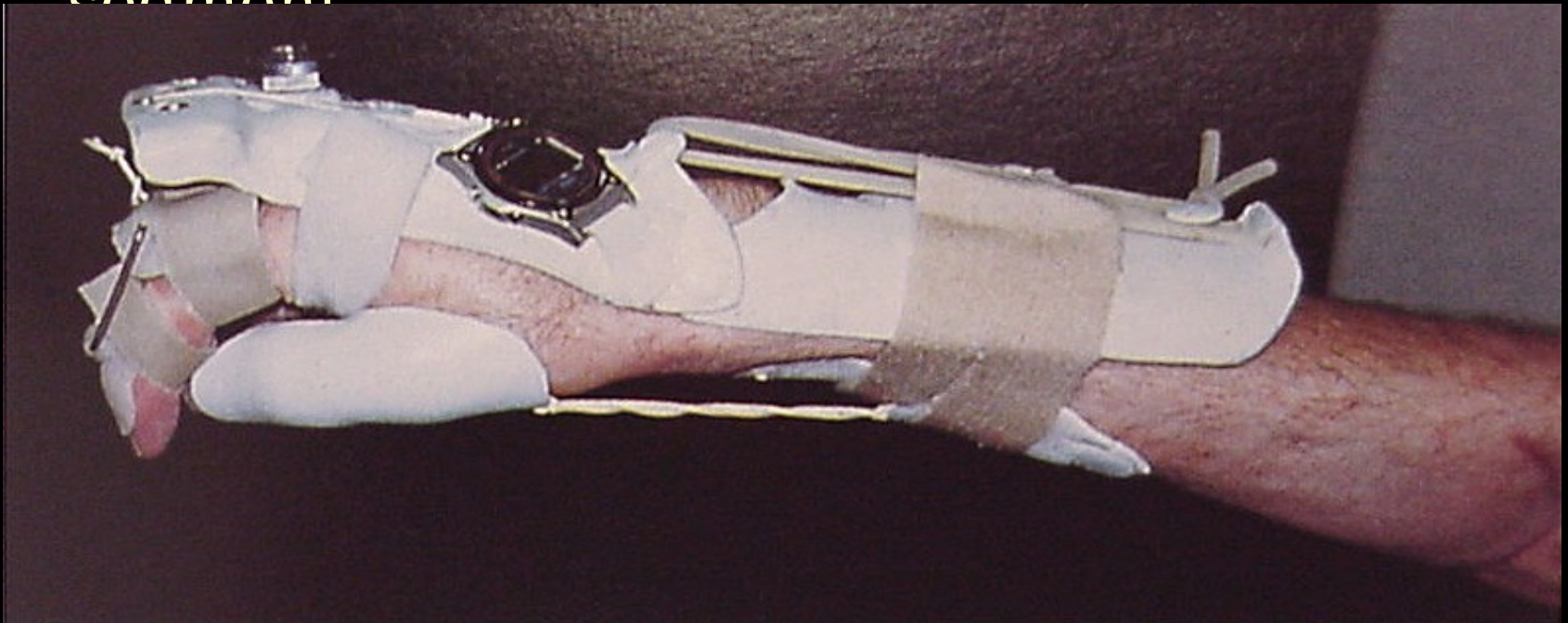
# *Allied Health Professionals*

- Occupational Therapy
  - ADL's (assistive devices, orthotics)
  - Ergonomics, work evaluation
  - Modalities (pain, ROM, desensitization)
- Physical Therapy
  - ROM, Strengthening, Aerobic Conditioning
  - Mobility (Transfers, ambulation, prosthetic & wheelchair training)
  - Modalities (pain, inflammation, ROM, inc participation in therapy)
- Speech & Language Pathology
  - Swallowing, Cognitive, Communication

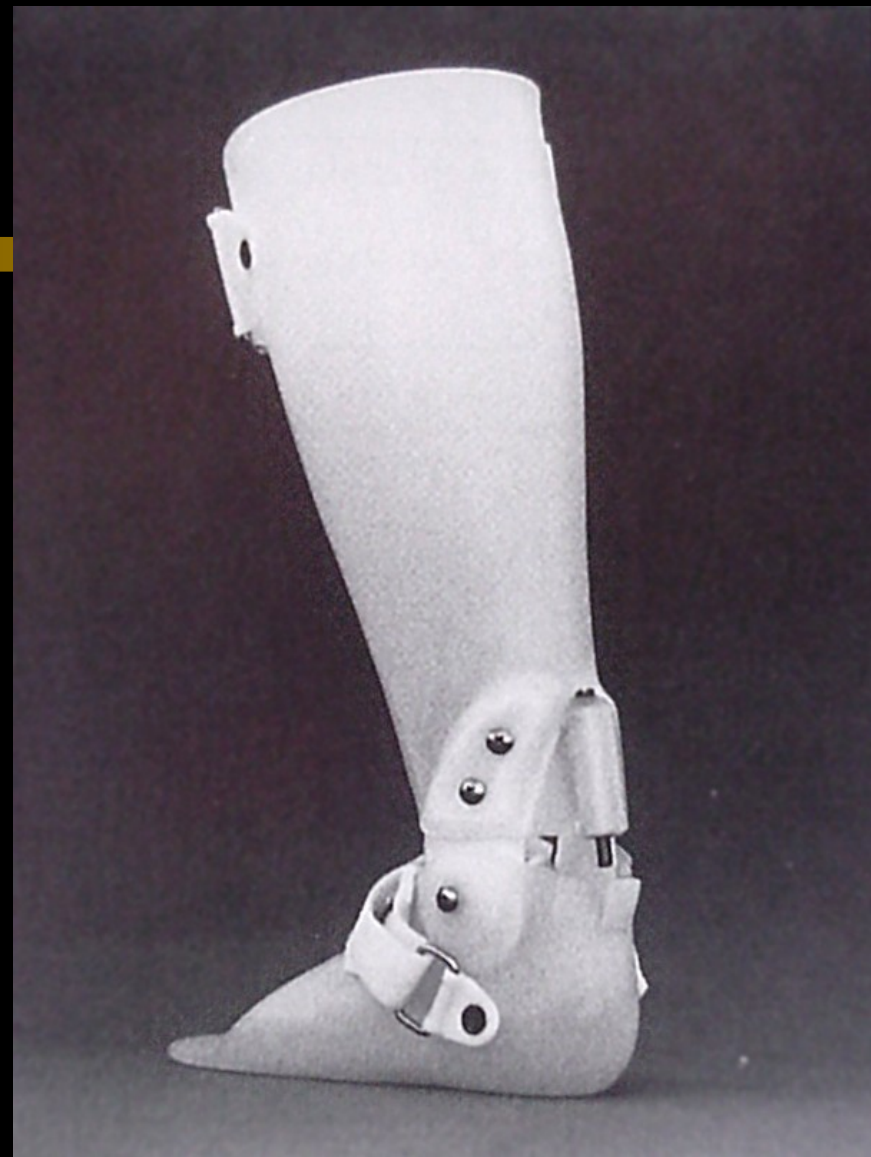


# *Orthotics*

- A device attached or applied to the external surface of the body to improve function, restrict or enforce motion, or support a body segment







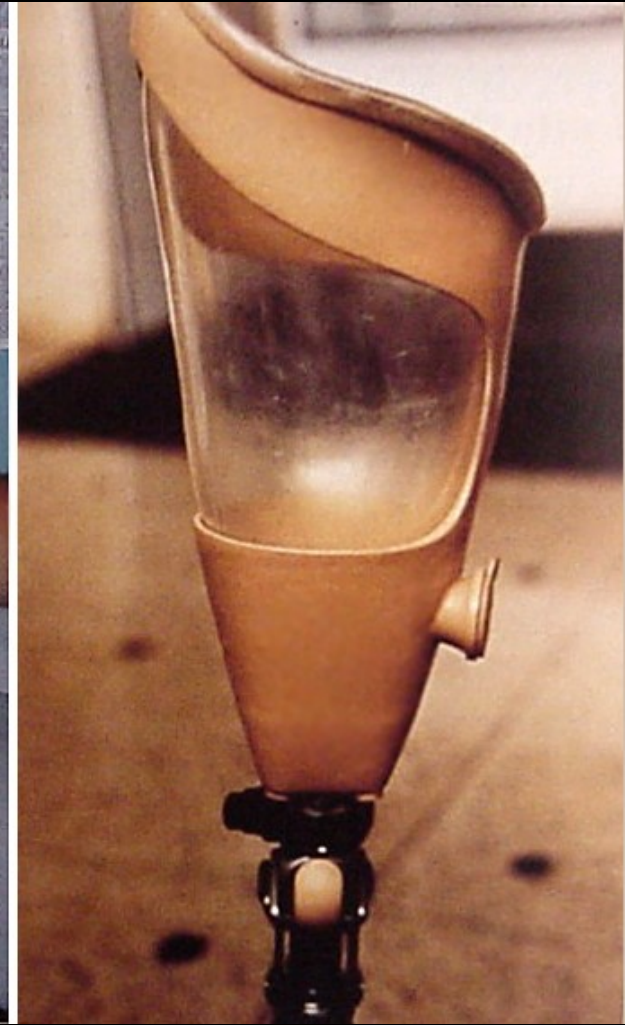
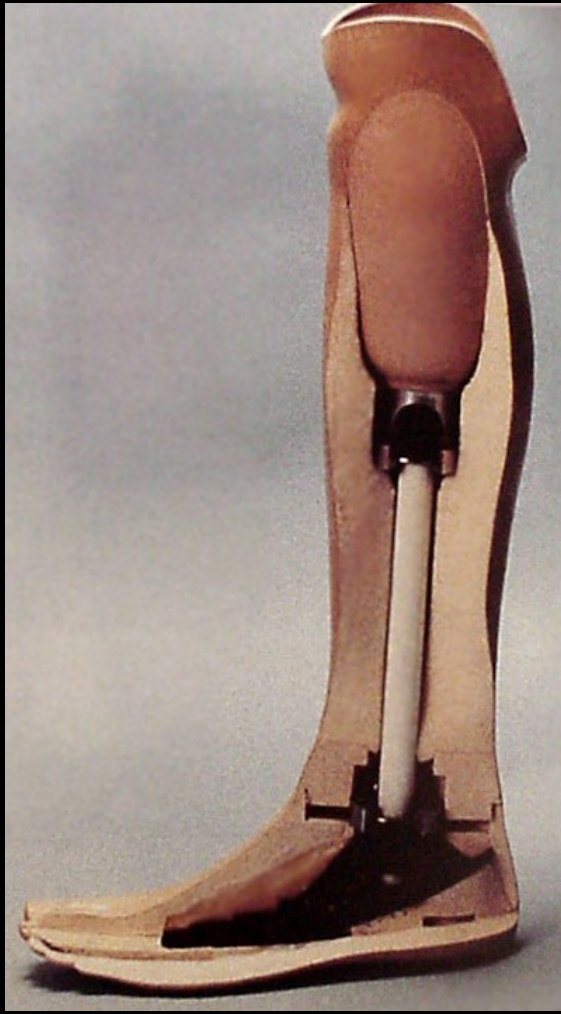
# *Amputees*



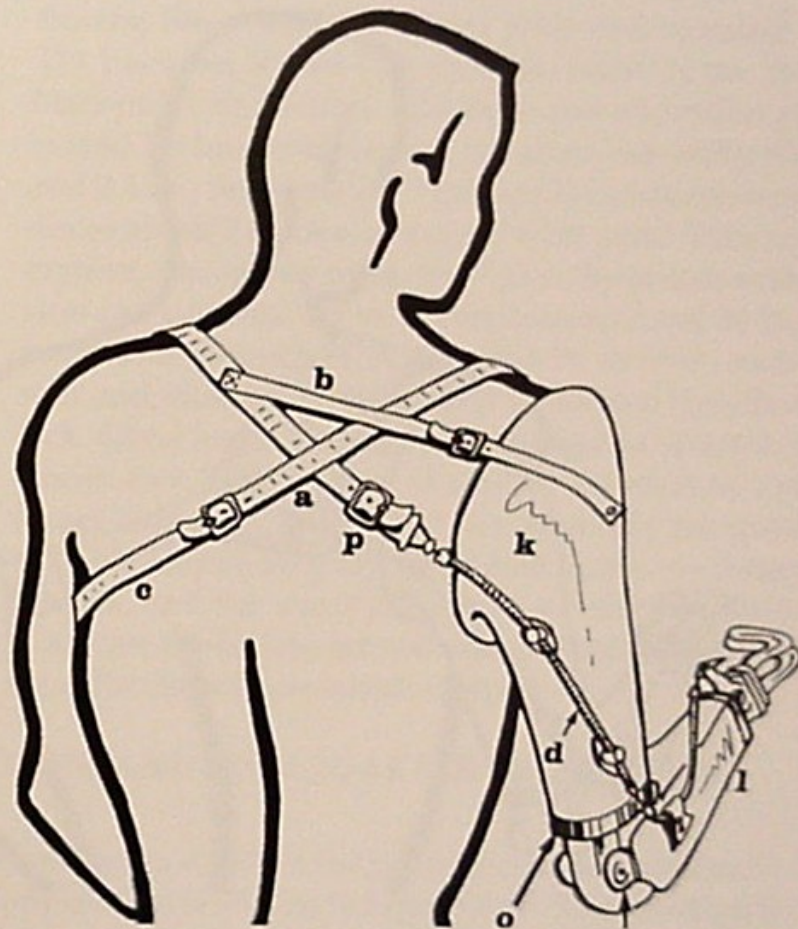
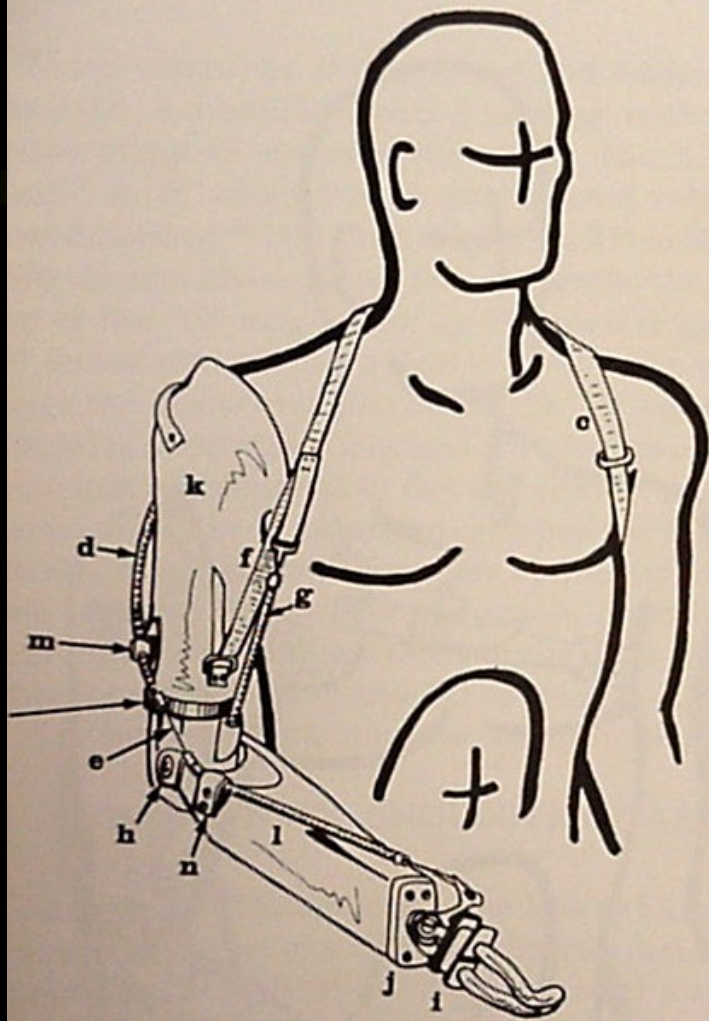
- Preprosthetic Training
- Proper limb care
- Prosthetic prescription
- Prosthetic training
- Phantom / Residual Limb Pain
- Functional independence













# *Pediatric Rehabilitation*

- Brachial plexus injuries
- Limb deficiencies
- Cerebral Palsy, Spina bifida, Muscular Dystrophies, SMA
- Help meet milestones
- Help promote development in gross motor and fine motor skills.
- verbal/cognitive

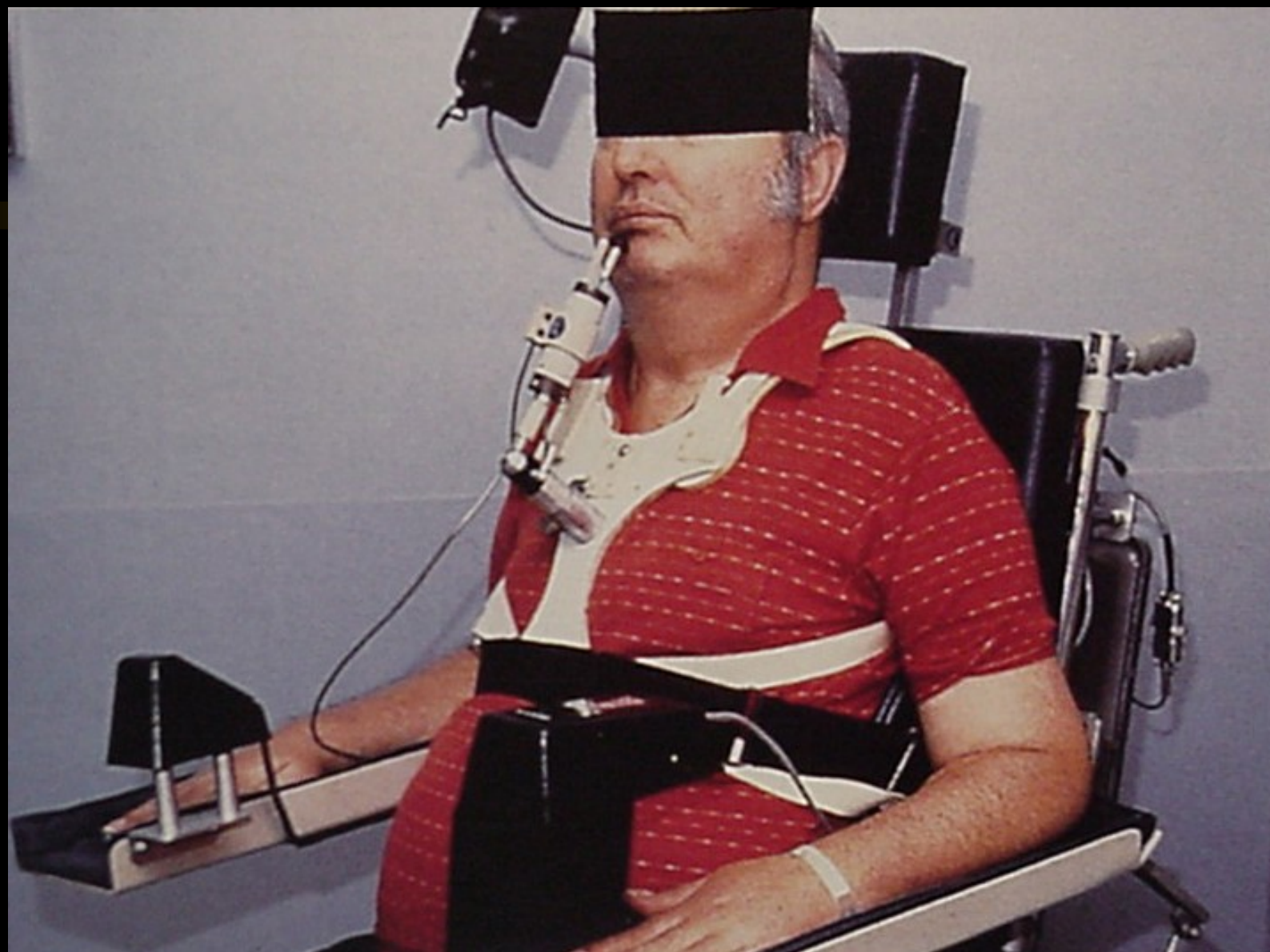






# *Spinal Cord Injuries*

- Identify level
- Manage medical problems
- Spasticity
- Effects of immobility
- Bowel/Bladder
- Sexual function/fertility
- Skin care
- Mobility
- Wheelchair prescription
- Community re-integration
- Vocational Rehab
- Home, work, car accommodations





# *Burn Rehabilitation*



- Wound care
- Positioning / Splinting
- Neuromuscular complications
- Scar management
- Exercise prescription
- Hand rehabilitation
- Mobility





# *Recreation & Sport Opportunities for Individuals with Disabilities*



- Decreased LOS
- Access
- Awareness







